



12065 Lebanon Rd.  
Mt. Juliet, TN 37122  
(615) 758-5858  
1-800-767-5859  
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

Dave Nicholson  
Linn Energy - Denver, CO  
1999 Broadway, Suite 3700  
Denver, CO 80202

## Report Summary

Wednesday June 03, 2015

Report Number: L767456

Samples Received: 05/27/15

Client Project:

Description: Pit and Landfarm Soil Sampling

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Mark W. Beasley , ESC Representative

### Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,  
FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016,  
NC - ENV375/DW21704/BIO041, ND - R-140. NJ - TN002, NJ NELAP - TN002,  
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,  
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,  
TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364, EPA - TN002

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REPORT OF ANALYSIS

Dave Nicholson  
 Linn Energy - Denver, CO  
 1999 Broadway, Suite 3700  
 Denver, CO 80202

June 03, 2015

Date Received : May 27, 2015  
 Description : Pit and Landfarm Soil Sampling  
 Sample ID : K-15 SPILL SPOILS  
 Collected By : DK Nicholson  
 Collection Date : 05/23/15 13:05

ESC Sample # : L767456-01  
 Site ID :  
 Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chromium, Hexavalent	BDL	2.0	mg/kg	3060A/7196A	06/01/15	1
ORP	-2.0		mV	2580 B-2011	05/29/15	1
pH	7.1	0.10	su	9045D	06/01/15	1
Sodium Adsorption Ratio	8.4			Calc.	06/01/15	1
Specific Conductance	570		umhos/cm	9050AMod	05/29/15	1
Mercury	0.029	0.020	mg/kg	7471A	05/29/15	1
Arsenic	3.7	2.0	mg/kg	6010B	06/01/15	1
Barium	440	0.50	mg/kg	6010B	06/01/15	1
Boron	BDL	10.	mg/kg	6010B	06/01/15	1
Cadmium	BDL	0.50	mg/kg	6010B	06/01/15	1
Chromium	38.	1.0	mg/kg	6010B	06/01/15	1
Copper	15.	2.0	mg/kg	6010B	06/01/15	1
Lead	14.	0.50	mg/kg	6010B	06/01/15	1
Nickel	20.	2.0	mg/kg	6010B	06/01/15	1
Selenium	BDL	2.0	mg/kg	6010B	06/01/15	1
Silver	BDL	1.0	mg/kg	6010B	06/01/15	1
Zinc	46.	5.0	mg/kg	6010B	06/01/15	1
TPH (GC/FID) Low Fraction	2.1	0.50	mg/kg	8015D/GRO	06/02/15	5
Surrogate Recovery (70-130)						
a,a,a-Trifluorotoluene(FID)	99.7		% Rec.	8015D/GRO	06/02/15	1
Benzene	BDL	0.0050	mg/kg	8260B	06/01/15	5
Toluene	BDL	0.025	mg/kg	8260B	06/01/15	5
Ethylbenzene	BDL	0.0050	mg/kg	8260B	06/01/15	5
Total Xylenes	BDL	0.015	mg/kg	8260B	06/01/15	5
Surrogate Recovery						
Toluene-d8	102.		% Rec.	8260B	06/01/15	1
Dibromofluoromethane	91.1		% Rec.	8260B	06/01/15	1
a,a,a-Trifluorotoluene	103.		% Rec.	8260B	06/01/15	1
4-Bromofluorobenzene	103.		% Rec.	8260B	06/01/15	1
Diesel and Oil Ranges						
C10-C28 Diesel Range	680	50.	mg/kg	8015	06/02/15	12.5
C28-C40 Oil Range	57.	50.	mg/kg	8015	06/02/15	12.5
Surrogate Recovery						
o-Terphenyl	60.4		% Rec.	8015	06/02/15	12.5

BDL - Below Detection Limit  
 Det. Limit - Practical Quantitation Limit(PQL)  
 L767456-01 (PH) - 7.1 at 20.9c



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Date Received : May 27, 2015  
 Description : Pit and Landfarm Soil Sampling  
 Sample ID : K-15 SPILL SPOILS  
 Collected By : DK Nicholson  
 Collection Date : 05/23/15 13:05

ESC Sample # : L767456-01  
 Site ID :  
 Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.0060	mg/kg	8270C-SIM	05/31/15	1
Acenaphthene	BDL	0.0060	mg/kg	8270C-SIM	05/31/15	1
Acenaphthylene	BDL	0.0060	mg/kg	8270C-SIM	05/31/15	1
Benzo(a)anthracene	BDL	0.0060	mg/kg	8270C-SIM	05/31/15	1
Benzo(a)pyrene	0.0091	0.0060	mg/kg	8270C-SIM	05/31/15	1
Benzo(b)fluoranthene	0.016	0.0060	mg/kg	8270C-SIM	05/31/15	1
Benzo(g,h,i)perylene	0.012	0.0060	mg/kg	8270C-SIM	05/31/15	1
Benzo(k)fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	05/31/15	1
Chrysene	BDL	0.0060	mg/kg	8270C-SIM	05/31/15	1
Dibenz(a,h)anthracene	BDL	0.0060	mg/kg	8270C-SIM	05/31/15	1
Fluoranthene	BDL	0.0060	mg/kg	8270C-SIM	05/31/15	1
Fluorene	BDL	0.0060	mg/kg	8270C-SIM	05/31/15	1
Indeno(1,2,3-cd)pyrene	0.0083	0.0060	mg/kg	8270C-SIM	05/31/15	1
Naphthalene	BDL	0.020	mg/kg	8270C-SIM	05/31/15	1
Phenanthrene	0.0081	0.0060	mg/kg	8270C-SIM	05/31/15	1
Pyrene	0.0066	0.0060	mg/kg	8270C-SIM	05/31/15	1
1-Methylnaphthalene	BDL	0.020	mg/kg	8270C-SIM	05/31/15	1
2-Methylnaphthalene	BDL	0.020	mg/kg	8270C-SIM	05/31/15	1
2-Chloronaphthalene	BDL	0.020	mg/kg	8270C-SIM	05/31/15	1
Surrogate Recovery						
p-Terphenyl-d14	57.4		% Rec.	8270C-SIM	05/31/15	1
Nitrobenzene-d5	67.2		% Rec.	8270C-SIM	05/31/15	1
2-Fluorobiphenyl	58.4		% Rec.	8270C-SIM	05/31/15	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 06/03/15 15:55 Printed: 06/03/15 16:18  
 L767456-01 (PH) - 7.1 at 20.9c

Attachment A  
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L767456-02	WG792964	SAMP	Paint Filter Test	R3041008	T4

Attachment B  
Explanation of QC Qualifier Codes

Qualifier	Meaning
T4	(ESC) - Additional method/sample information: QNS - Quantity Not Sufficient

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods, it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

- Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.
- Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Difference.
- Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.
- TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.



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Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Mercury	< .02	mg/kg			WG791985	05/29/15 09:37
Specific Conductance	1.10	umhos/cm			WG792011	05/29/15 13:57
1-Methylnaphthalene	< .02	mg/kg			WG792060	05/31/15 02:28
2-Chloronaphthalene	< .02	mg/kg			WG792060	05/31/15 02:28
2-Methylnaphthalene	< .02	mg/kg			WG792060	05/31/15 02:28
Acenaphthene	< .006	mg/kg			WG792060	05/31/15 02:28
Acenaphthylene	< .006	mg/kg			WG792060	05/31/15 02:28
Anthracene	< .006	mg/kg			WG792060	05/31/15 02:28
Benzo(a)anthracene	< .006	mg/kg			WG792060	05/31/15 02:28
Benzo(a)pyrene	< .006	mg/kg			WG792060	05/31/15 02:28
Benzo(b)fluoranthene	< .006	mg/kg			WG792060	05/31/15 02:28
Benzo(g,h,i)perylene	< .006	mg/kg			WG792060	05/31/15 02:28
Benzo(k)fluoranthene	< .006	mg/kg			WG792060	05/31/15 02:28
Chrysene	< .006	mg/kg			WG792060	05/31/15 02:28
Dibenz(a,h)anthracene	< .006	mg/kg			WG792060	05/31/15 02:28
Fluoranthene	< .006	mg/kg			WG792060	05/31/15 02:28
Fluorene	< .006	mg/kg			WG792060	05/31/15 02:28
Indeno(1,2,3-cd)pyrene	< .006	mg/kg			WG792060	05/31/15 02:28
Naphthalene	< .02	mg/kg			WG792060	05/31/15 02:28
Phenanthrene	< .006	mg/kg			WG792060	05/31/15 02:28
Pyrene	< .006	mg/kg			WG792060	05/31/15 02:28
2-Fluorobiphenyl		% Rec.	53.30	40.6-122	WG792060	05/31/15 02:28
Nitrobenzene-d5		% Rec.	58.30	22.1-146	WG792060	05/31/15 02:28
p-Terphenyl-d14		% Rec.	52.80	32.2-131	WG792060	05/31/15 02:28
Reactive Sulf.(SW846 7.3.4.1)	< 25	mg/kg			WG792352	05/30/15 13:08
Benzene	< .001	mg/kg			WG791168	06/01/15 11:54
Ethylbenzene	< .001	mg/kg			WG791168	06/01/15 11:54
Toluene	< .005	mg/kg			WG791168	06/01/15 11:54
Total Xylenes	< .003	mg/kg			WG791168	06/01/15 11:54
4-Bromofluorobenzene		% Rec.	106.0	69.7-129	WG791168	06/01/15 11:54
Dibromofluoromethane		% Rec.	89.00	76.3-123	WG791168	06/01/15 11:54
Toluene-d8		% Rec.	103.0	88.7-115	WG791168	06/01/15 11:54
a,a,a-Trifluorotoluene		% Rec.	102.0	87.2-117	WG791168	06/01/15 11:54
Chromium,Hexavalent	< 2	mg/kg			WG792360	06/01/15 15:00
TPH (GC/FID) High Fraction	< 4	mg/kg			WG792114	06/01/15 12:44
o-Terphenyl		% Rec.	95.90	50-150	WG792114	06/01/15 12:44
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG792217	06/01/15 16:37
a,a,a-Trifluorotoluene(FID)		% Rec.	99.00	59-128	WG792217	06/01/15 16:37
Mercury	< .01	mg/l			WG792730	06/01/15 20:00
Arsenic	< .45	mg/l			WG792742	06/02/15 03:09
Barium	< 1.35	mg/l			WG792742	06/02/15 03:09

\* Performance of this Analyte is outside of established criteria.  
 For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'



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Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Cadmium	< .45	mg/l			WG792742	06/02/15 03:09
Chromium	< .45	mg/l			WG792742	06/02/15 03:09
Lead	< .45	mg/l			WG792742	06/02/15 03:09
Selenium	< .45	mg/l			WG792742	06/02/15 03:09
Silver	< .45	mg/l			WG792742	06/02/15 03:09
Arsenic	< 2	mg/kg			WG791901	06/01/15 16:43
Barium	< .5	mg/kg			WG791901	06/01/15 16:43
Boron	< 10	mg/kg			WG791901	06/01/15 16:43
Cadmium	< .5	mg/kg			WG791901	06/01/15 16:43
Chromium	< 1	mg/kg			WG791901	06/01/15 16:43
Copper	< 2	mg/kg			WG791901	06/01/15 16:43
Lead	< .5	mg/kg			WG791901	06/01/15 16:43
Nickel	< 2	mg/kg			WG791901	06/01/15 16:43
Selenium	< 2	mg/kg			WG791901	06/01/15 16:43
Silver	< 1	mg/kg			WG791901	06/01/15 16:43
Zinc	< 5	mg/kg			WG791901	06/01/15 16:43
C10-C28 Diesel Range	< 4	mg/kg			WG792699	06/02/15 00:20
C28-C40 Oil Range	< 4	mg/kg			WG792699	06/02/15 00:20
o-Terphenyl		% Rec.	105.0	50-150	WG792699	06/02/15 00:20
Reactive CN (SW846 7.3.3.2)	< .125	mg/kg			WG792353	06/02/15 10:29
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG792878	06/02/15 13:34
a,a,a-Trifluorotoluene(FID)		% Rec.	101.0	59-128	WG792878	06/02/15 13:34

Analyte	Units	Result	Duplicate		RPD	Limit	Ref Samp	Batch
			Duplicate					
Specific Conductance	umhos/cm	7200	7200		0.554	20	L767365-01	WG792011
ORP	mV	80.0	79.0		1.26	20	L766944-01	WG792289
ORP	mV	19.0	19.0		0.0	20	L767744-03	WG792289
Reactive Sulf.(SW846 7.3.4.1)	mg/kg	0.0	0.0		0.0	20	L767333-01	WG792352
Chromium,Hexavalent	mg/kg	0.0	0.0		0.0	20	L767945-10	WG792360
pH	su	9.60	9.60		0.416	1	L767403-01	WG792357
pH	su	8.60	8.70		1.16*	1	L767966-06	WG792357
Reactive CN (SW846 7.3.3.2)	mg/kg	0.0	0.0		0.0	20	L767333-01	WG792353
Ignitability	Deg. F	0.00	0.00		0.00	10	L768167-01	WG792780
Paint Filter Test	%	0.0	0.0		0.0	20	L768167-01	WG792964

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Analyte	Units	Duplicate		RPD	Limit	Ref Samp	Batch
		Result	Duplicate				
Corrosivity		0.0	0.0	0.0	10	L768101-11	WG792950

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Mercury	mg/kg	.3	0.264	88.0	80-120	WG791985
Specific Conductance	umhos/cm	534	550.	103.	85-115	WG792011
ORP	mV	100	101.	101.	90-110	WG792289
1-Methylnaphthalene	mg/kg	.08	0.0510	63.8	50.6-122	WG792060
2-Chloronaphthalene	mg/kg	.08	0.0467	58.3	53.9-121	WG792060
2-Methylnaphthalene	mg/kg	.08	0.0483	60.4	50.4-120	WG792060
Acenaphthene	mg/kg	.08	0.0464	58.0	52.4-120	WG792060
Acenaphthylene	mg/kg	.08	0.0484	60.5	49.6-120	WG792060
Anthracene	mg/kg	.08	0.0491	61.4	50.3-130	WG792060
Benzo(a)anthracene	mg/kg	.08	0.0512	64.0	46.7-125	WG792060
Benzo(a)pyrene	mg/kg	.08	0.0487	60.8	42.3-119	WG792060
Benzo(b)fluoranthene	mg/kg	.08	0.0504	63.0	43.6-124	WG792060
Benzo(g,h,i)perylene	mg/kg	.08	0.0494	61.8	45.1-132	WG792060
Benzo(k)fluoranthene	mg/kg	.08	0.0474	59.2	46.1-131	WG792060
Chrysene	mg/kg	.08	0.0485	60.7	49.5-131	WG792060
Dibenz(a,h)anthracene	mg/kg	.08	0.0503	62.9	44.8-133	WG792060
Fluoranthene	mg/kg	.08	0.0478	59.8	49.3-128	WG792060
Fluorene	mg/kg	.08	0.0468	58.5	50.6-121	WG792060
Indeno(1,2,3-cd)pyrene	mg/kg	.08	0.0513	64.1	46.1-135	WG792060
Naphthalene	mg/kg	.08	0.0458	57.2	49.6-115	WG792060
Phenanthrene	mg/kg	.08	0.0463	57.8	48.8-121	WG792060
Pyrene	mg/kg	.08	0.0558	69.7	44.7-130	WG792060
2-Fluorobiphenyl				57.00	40.6-122	WG792060
Nitrobenzene-d5				61.60	22.1-146	WG792060
p-Terphenyl-d14				56.80	32.2-131	WG792060

Reactive Sulf.(SW846 7.3.4.1)	mg/kg	100	74.6	74.6	70-130	WG792352
Benzene	mg/kg	.025	0.0233	93.1	72.6-120	WG791168
Ethylbenzene	mg/kg	.025	0.0273	109.	78.6-124	WG791168
Toluene	mg/kg	.025	0.0255	102.	76.7-116	WG791168
Total Xylenes	mg/kg	.075	0.0813	108.	78.1-123	WG791168
4-Bromofluorobenzene				100.0	69.7-129	WG791168
Dibromofluoromethane				90.00	76.3-123	WG791168
Toluene-d8				103.0	88.7-115	WG791168
a,a,a-Trifluorotoluene				100.0	87.2-117	WG791168

Chromium,Hexavalent	mg/kg	59.8	59.8	100.	80-120	WG792360
pH	su	7.84	7.86	100.	98.3-101.7	WG792357
TPH (GC/FID) High Fraction	mg/kg	60	58.1	96.8	50-150	WG792114

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Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
o-Terphenyl				92.10	50-150	
TPH (GC/FID) Low Fraction	mg/kg	5.5	4.86	88.3	63.5-137	WG792217
a,a,a-Trifluorotoluene(FID)				99.30	59-128	WG792217
Mercury	mg/l	.03	0.0295	98.0	80-120	WG792730
Arsenic	mg/l	9	9.86	110.	80-120	WG792742
Barium	mg/l	9	10.2	113.	80-120	WG792742
Cadmium	mg/l	9	9.84	109.	80-120	WG792742
Chromium	mg/l	9	10.2	113.	80-120	WG792742
Lead	mg/l	9	9.85	109.	80-120	WG792742
Selenium	mg/l	9	9.88	110.	80-120	WG792742
Silver	mg/l	9	9.74	108.	80-120	WG792742
Arsenic	mg/kg	100	107.	107.	80-120	WG791901
Barium	mg/kg	100	109.	109.	80-120	WG791901
Boron	mg/kg	100	106.	106.	80-120	WG791901
Cadmium	mg/kg	100	109.	109.	80-120	WG791901
Chromium	mg/kg	100	109.	109.	80-120	WG791901
Copper	mg/kg	100	105.	105.	80-120	WG791901
Lead	mg/kg	100	108.	108.	80-120	WG791901
Nickel	mg/kg	100	106.	106.	80-120	WG791901
Selenium	mg/kg	100	110.	110.	80-120	WG791901
Silver	mg/kg	100	108.	108.	80-120	WG791901
Zinc	mg/kg	100	106.	106.	80-120	WG791901
C10-C28 Diesel Range	mg/kg	60	49.5	82.6	50-100	WG792699
o-Terphenyl				112.0	50-150	WG792699
Reactive CN (SW846 7.3.3.2)	mg/kg	.1	0.102	102.	50-150	WG792353
Ignitability	Deg. F	82	83.0	101.	93-107	WG792780
TPH (GC/FID) Low Fraction	mg/kg	5.5	5.79	105.	63.5-137	WG792878
a,a,a-Trifluorotoluene(FID)				98.90	59-128	WG792878
Corrosivity		7.84	7.80	99.5	98.3-101.7	WG792950

Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
Mercury	mg/kg	0.279	0.264	93.0	80-120	5.00	20	WG791985
Specific Conductance	umhos/	550.	550.	103.	85-115	0.0	20	WG792011
ORP	mV	102.	101.	102.	90-110	0.985	20	WG792289
1-Methylnaphthalene	mg/kg	0.0481	0.0510	60.0	50.6-122	5.96	20	WG792060

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Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
2-Chloronaphthalene	mg/kg	0.0446	0.0467	56.0	53.9-121	4.54	20	WG792060
2-Methylnaphthalene	mg/kg	0.0453	0.0483	56.0	50.4-120	6.50	20	WG792060
Acenaphthene	mg/kg	0.0442	0.0464	55.0	52.4-120	4.97	20	WG792060
Acenaphthylene	mg/kg	0.0465	0.0484	58.0	49.6-120	4.05	20	WG792060
Anthracene	mg/kg	0.0475	0.0491	59.0	50.3-130	3.32	20	WG792060
Benzo(a)anthracene	mg/kg	0.0488	0.0512	61.0	46.7-125	4.83	20	WG792060
Benzo(a)pyrene	mg/kg	0.0460	0.0487	58.0	42.3-119	5.61	20	WG792060
Benzo(b)fluoranthene	mg/kg	0.0462	0.0504	58.0	43.6-124	8.68	20	WG792060
Benzo(g,h,i)perylene	mg/kg	0.0468	0.0494	58.0	45.1-132	5.45	20	WG792060
Benzo(k)fluoranthene	mg/kg	0.0477	0.0474	60.0	46.1-131	0.620	20	WG792060
Chrysene	mg/kg	0.0470	0.0485	59.0	49.5-131	3.19	20	WG792060
Dibenz(a,h)anthracene	mg/kg	0.0477	0.0503	60.0	44.8-133	5.24	20	WG792060
Fluoranthene	mg/kg	0.0459	0.0478	57.0	49.3-128	4.15	20	WG792060
Fluorene	mg/kg	0.0448	0.0468	56.0	50.6-121	4.33	20	WG792060
Indeno(1,2,3-cd)pyrene	mg/kg	0.0486	0.0513	61.0	46.1-135	5.47	20	WG792060
Naphthalene	mg/kg	0.0432	0.0458	54.0	49.6-115	5.77	20	WG792060
Phenanthrene	mg/kg	0.0443	0.0463	55.0	48.8-121	4.26	20	WG792060
Pyrene	mg/kg	0.0535	0.0558	67.0	44.7-130	4.13	20	WG792060
2-Fluorobiphenyl				55.80	40.6-122			WG792060
Nitrobenzene-d5				60.40	22.1-146			WG792060
p-Terphenyl-d14				54.30	32.2-131			WG792060
Reactive Sulf.(SW846 7.3.4.1)	mg/kg	74.6	74.6	75.0	70-130	0.0	20	WG792352
Benzene	mg/kg	0.0225	0.0233	90.0	72.6-120	3.60	20	WG791168
Ethylbenzene	mg/kg	0.0268	0.0273	107.	78.6-124	1.60	20	WG791168
Toluene	mg/kg	0.0252	0.0255	101.	76.7-116	1.12	20	WG791168
Total Xylenes	mg/kg	0.0778	0.0813	104.	78.1-123	4.46	20	WG791168
4-Bromofluorobenzene				101.0	69.7-129			WG791168
Dibromofluoromethane				90.40	76.3-123			WG791168
Toluene-d8				104.0	88.7-115			WG791168
a,a,a-Trifluorotoluene				104.0	87.2-117			WG791168
Chromium,Hexavalent	mg/kg	59.8	59.8	100.	80-120	0.0	20	WG792360
pH	su	7.87	7.86	100.	98.3-101.7	0.127	20	WG792357
TPH (GC/FID) High Fraction	mg/kg	59.0	58.1	98.0	50-150	1.66	20	WG792114
o-Terphenyl				94.80	50-150			WG792114
TPH (GC/FID) Low Fraction	mg/kg	5.39	4.86	98.0	63.5-137	10.4	20	WG792217
a,a,a-Trifluorotoluene(FID)				98.20	59-128			WG792217
Mercury	mg/l	0.0304	0.0295	101.	80-120	3.00	20	WG792730
Arsenic	mg/l	9.92	9.86	110.	80-120	1.00	20	WG792742
Barium	mg/l	10.1	10.2	112.	80-120	1.00	20	WG792742
Cadmium	mg/l	9.79	9.84	109.	80-120	1.00	20	WG792742
Chromium	mg/l	10.3	10.2	114.	80-120	0.0	20	WG792742
Lead	mg/l	9.91	9.85	110.	80-120	1.00	20	WG792742
Selenium	mg/l	10.0	9.88	111.	80-120	1.00	20	WG792742

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Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
Silver	mg/l	9.72	9.74	108.	80-120	0.0	20	WG792742
Arsenic	mg/kg	103.	107.	103.	80-120	4.00	20	WG791901
Barium	mg/kg	106.	109.	106.	80-120	4.00	20	WG791901
Boron	mg/kg	102.	106.	102.	80-120	4.00	20	WG791901
Cadmium	mg/kg	105.	109.	105.	80-120	3.00	20	WG791901
Chromium	mg/kg	105.	109.	105.	80-120	4.00	20	WG791901
Copper	mg/kg	102.	105.	102.	80-120	3.00	20	WG791901
Lead	mg/kg	105.	108.	104.	80-120	3.00	20	WG791901
Nickel	mg/kg	102.	106.	102.	80-120	4.00	20	WG791901
Selenium	mg/kg	105.	110.	105.	80-120	4.00	20	WG791901
Silver	mg/kg	104.	108.	104.	80-120	4.00	20	WG791901
Zinc	mg/kg	103.	106.	103.	80-120	3.00	20	WG791901
C10-C28 Diesel Range o-Terphenyl	mg/kg	50.4	49.5	84.0 116.0	50-100 50-150	1.64	20	WG792699 WG792699
Reactive CN (SW846 7.3.3.2)	mg/kg	0.100	0.102	100.	50-150	1.98	20	WG792353
Ignitability	Deg. F	83.0	83.0	101.	93-107	0.00	20	WG792780
TPH (GC/FID) Low Fraction a,a,a-Trifluorotoluene(FID)	mg/kg	6.15	5.79	112. 98.90	63.5-137 59-128	5.97	20	WG792878 WG792878
Corrosivity		7.79	7.80	99.0	98.3-101.7	0.128	10	WG792950

Analyte	Units	Matrix Spike			% Rec	Limit	Ref Samp	Batch
		MS Res	Ref Res	TV				
Mercury	mg/kg	0.336	0.0114	.3	110.	75-125	L767562-01	WG791985
Chromium, Hexavalent	mg/kg	18.6	0.0	20	93.0	75-125	L767945-10	WG792360
TPH (GC/FID) High Fraction o-Terphenyl	mg/kg	150.	76.8	60	120. 51.80	50-150 50-150	L767365-01	WG792114 WG792114
Mercury	mg/l	0.0268	-0.000569	.03	89.0	75-125	L767326-01	WG792730
Mercury	mg/l	0.0294	-0.000783	.03	98.0	75-125	L767416-01	WG792730
Benzene	mg/kg	0.112	0.0137	.025	79.0	47.8-131	L766872-01	WG791168
Ethylbenzene	mg/kg	0.199	0.152	.025	38.0*	44.8-135	L766872-01	WG791168
Toluene	mg/kg	0.162	0.0985	.025	51.0	47.8-127	L766872-01	WG791168
Total Xylenes	mg/kg	0.668	0.548	.075	32.0*	42.7-135	L766872-01	WG791168
4-Bromofluorobenzene					99.30	69.7-129		WG791168
Dibromofluoromethane					90.60	76.3-123		WG791168
Toluene-d8					99.60	88.7-115		WG791168
a,a,a-Trifluorotoluene					99.80	87.2-117		WG791168

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Analyte	Units	MS Res	Matrix Spike		% Rec	Limit	Ref Samp	Batch
			Ref Res	TV				
Arsenic	mg/l	10.0	0.0214	9	110.	75-125	L767231-01	WG792742
Barium	mg/l	9.92	0.0219	9	110.	75-125	L767231-01	WG792742
Cadmium	mg/l	9.80	-0.00165	9	110.	75-125	L767231-01	WG792742
Chromium	mg/l	10.2	0.0199	9	110.	75-125	L767231-01	WG792742
Lead	mg/l	9.90	0.00841	9	110.	75-125	L767231-01	WG792742
Selenium	mg/l	10.1	0.0694	9	110.	75-125	L767231-01	WG792742
Silver	mg/l	9.74	-0.00896	9	110.	75-125	L767231-01	WG792742
Arsenic	mg/l	9.87	0.00830	9	110.	75-125	L767326-01	WG792742
Barium	mg/l	10.1	0.115	9	110.	75-125	L767326-01	WG792742
Cadmium	mg/l	9.71	-0.00469	9	110.	75-125	L767326-01	WG792742
Chromium	mg/l	10.2	-0.00111	9	110.	75-125	L767326-01	WG792742
Lead	mg/l	9.81	-0.00713	9	110.	75-125	L767326-01	WG792742
Selenium	mg/l	9.85	0.00779	9	110.	75-125	L767326-01	WG792742
Silver	mg/l	9.62	-0.0115	9	110.	75-125	L767326-01	WG792742
Arsenic	mg/kg	103.	1.78	100	100.	75-125	L767423-10	WG791901
Barium	mg/kg	109.	6.40	100	100.	75-125	L767423-10	WG791901
Boron	mg/kg	102.	1.15	100	100.	75-125	L767423-10	WG791901
Cadmium	mg/kg	104.	-0.0246	100	100.	75-125	L767423-10	WG791901
Chromium	mg/kg	118.	54.8	100	63.0*	75-125	L767423-10	WG791901
Copper	mg/kg	115.	23.6	100	92.0	75-125	L767423-10	WG791901
Lead	mg/kg	145.	54.7	100	91.0	75-125	L767423-10	WG791901
Nickel	mg/kg	126.	37.4	100	88.0	75-125	L767423-10	WG791901
Selenium	mg/kg	106.	-0.0881	100	110.	75-125	L767423-10	WG791901
Silver	mg/kg	102.	0.0438	100	100.	75-125	L767423-10	WG791901
Zinc	mg/kg	114.	20.0	100	94.0	75-125	L767423-10	WG791901
TPH (GC/FID) Low Fraction	mg/kg	21.0	2.39	5.5	68.0	28.5-138	L767693-05	WG792217
a,a,a-Trifluorotoluene(FID)					96.40	59-128		WG792217
TPH (GC/FID) Low Fraction	mg/kg	23.9	0.0	5.5	87.0	28.5-138	L768039-02	WG792878
a,a,a-Trifluorotoluene(FID)					96.40	59-128		WG792878

Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Mercury	mg/kg	0.316	0.336	101.	75-125	6.00	20	L767562-01	WG791985
Chromium,Hexavalent	mg/kg	18.6	18.6	93.0	75-125	0.0	20	L767945-10	WG792360
TPH (GC/FID) High Fraction	mg/kg	130.	150.	89.0	50-150	14.3	20	L767365-01	WG792114
o-Terphenyl				58.60	50-150				WG792114
Mercury	mg/l	0.0256	0.0268	87.1	75-125	5.00	20	L767326-01	WG792730
Mercury	mg/l	0.0298	0.0294	102.	75-125	2.00	20	L767416-01	WG792730
Benzene	mg/kg	0.103	0.112	71.3	47.8-131	8.53	22.8	L766872-01	WG791168
Ethylbenzene	mg/kg	0.172	0.199	16.2*	44.8-135	14.5	26.9	L766872-01	WG791168
Toluene	mg/kg	0.146	0.162	37.7*	47.8-127	10.7	24.3	L766872-01	WG791168
Total Xylenes	mg/kg	0.570	0.668	6.08*	42.7-135	15.8	26.6	L766872-01	WG791168
4-Bromofluorobenzene				104.0	69.7-129				WG791168
Dibromofluoromethane				90.30	76.3-123				WG791168

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Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Toluene-d8				102.0	88.7-115				
a,a,a-Trifluorotoluene				101.0	87.2-117				
Arsenic	mg/l	9.89	10.0	110.	75-125	1.00	20	L767231-01	WG792742
Barium	mg/l	9.91	9.92	110.	75-125	0.0	20	L767231-01	WG792742
Cadmium	mg/l	9.76	9.80	108.	75-125	0.0	20	L767231-01	WG792742
Chromium	mg/l	10.1	10.2	111.	75-125	1.00	20	L767231-01	WG792742
Lead	mg/l	9.81	9.90	109.	75-125	1.00	20	L767231-01	WG792742
Selenium	mg/l	9.96	10.1	110.	75-125	2.00	20	L767231-01	WG792742
Silver	mg/l	9.72	9.74	108.	75-125	0.0	20	L767231-01	WG792742
Arsenic	mg/l	10.1	9.87	112.	75-125	2.00	20	L767326-01	WG792742
Barium	mg/l	10.2	10.1	112.	75-125	1.00	20	L767326-01	WG792742
Cadmium	mg/l	9.81	9.71	109.	75-125	1.00	20	L767326-01	WG792742
Chromium	mg/l	10.4	10.2	115.	75-125	1.00	20	L767326-01	WG792742
Lead	mg/l	9.95	9.81	111.	75-125	1.00	20	L767326-01	WG792742
Selenium	mg/l	10.0	9.85	111.	75-125	2.00	20	L767326-01	WG792742
Silver	mg/l	9.69	9.62	108.	75-125	1.00	20	L767326-01	WG792742
Arsenic	mg/kg	106.	103.	104.	75-125	3.00	20	L767423-10	WG791901
Barium	mg/kg	111.	109.	105.	75-125	2.00	20	L767423-10	WG791901
Boron	mg/kg	104.	102.	103.	75-125	3.00	20	L767423-10	WG791901
Cadmium	mg/kg	106.	104.	106.	75-125	2.00	20	L767423-10	WG791901
Chromium	mg/kg	118.	118.	63.2*	75-125	0.0	20	L767423-10	WG791901
Copper	mg/kg	116.	115.	92.0	75-125	0.0	20	L767423-10	WG791901
Lead	mg/kg	157.	145.	102.	75-125	8.00	20	L767423-10	WG791901
Nickel	mg/kg	125.	126.	87.6	75-125	0.0	20	L767423-10	WG791901
Selenium	mg/kg	108.	106.	108.	75-125	2.00	20	L767423-10	WG791901
Silver	mg/kg	104.	102.	104.	75-125	2.00	20	L767423-10	WG791901
Zinc	mg/kg	116.	114.	96.1	75-125	2.00	20	L767423-10	WG791901
TPH (GC/FID) Low Fraction	mg/kg	22.4	21.0	72.8	28.5-138	6.52	23.6	L767693-05	WG792217
a,a,a-Trifluorotoluene(FID)				97.20	59-128				WG792217
TPH (GC/FID) Low Fraction	mg/kg	21.2	23.9	77.1	28.5-138	12.0	23.6	L768039-02	WG792878
a,a,a-Trifluorotoluene(FID)				97.10	59-128				WG792878

Post Spike

Serial Dilution

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Serial Dilution

Batch number /Run number / Sample number cross reference

WG791985: R3040100: L767456-01  
WG792011: R3040171: L767456-01  
WG792289: R3040178: L767456-01  
WG792060: R3040413 R3040707: L767456-01  
WG792352: R3040446: L767456-02  
WG792473: R3040546: L767456-02  
WG791168: R3040567: L767456-01 03  
WG792114: R3040594: L767456-03  
WG792360: R3040605: L767456-01  
WG792357: R3040612: L767456-01  
WG792217: R3040668: L767456-03  
WG791903: R3040673: L767456-01  
WG792730: R3040680: L767456-02  
WG791901: R3040700 R3040965: L767456-01  
WG792742: R3040711: L767456-02  
WG792699: R3040729: L767456-01  
WG792353: R3040773: L767456-02  
WG792780: R3040897: L767456-02  
WG792878: R3040905: L767456-01  
WG792964: R3041008: L767456-02  
WG792950: R3041062: L767456-02

\* \* Calculations are performed prior to rounding of reported values.

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June 03, 2015

The data package includes a summary of the analytic results of the quality control samples required by the SW-846 or CWA methods. The quality control samples include a method blank, a laboratory control sample, and the matrix spike/matrix spike duplicate analysis. If a target parameter is outside the method limits, every sample that is effected is flagged with the appropriate qualifier in Appendix B of the analytic report.

Method Blank - an aliquot of reagent water carried through the entire analytic process. The method blank results indicate if any possible contamination exposure during the sample handling, digestion or extraction process, and analysis. Concentrations of target analytes above the reporting limit in the method blank are qualified with the "B" qualifier.

Laboratory Control Sample - is a sample of known concentration that is carried through the digestion/extraction and analysis process. The percent recovery, expressed as a percentage of the theoretical concentration, has statistical control limits indicating that the analytic process is "in control". If a target analyte is outside the control limits for the laboratory control sample or any other control sample, the parameter is flagged with a "J4" qualifier for all effected samples.

Matrix Spike and Matrix Spike Duplicate - is two aliquots of an environmental sample that is spiked with known concentrations of target analytes. The percent recovery of the target analytes also has statistical control limits. If any recoveries that are outside the method control limits, the sample that was selected for matrix spike/matrix spike duplicate analysis is flagged with either a "J5" or a "J6". The relative percent difference (%RPD) between the matrix spike and the matrix spike duplicate recoveries is all calculated. If the RPD is above the method limit, the effected samples are flagged with a "J3" qualifier.